Data Support Co., Inc.

DSC HFT1000M
Digital Moisture Analyzer

- ✓ Simple to Use
- ✓ Compact & Easy to Clean
- ✓ No Complicated Buttons or Menus

Owner's Manual

Toll Free: 800-726-5883

14639 Arminta Street * Panorama City, CA 91402

1. INTRODUCTION

Safety Precautions

For safe and dependable operation of this Fat Tester, please comply with the following safety precautions:

- Use the Fat Tester exclusively for determination of fat in ground beef or pork samples. Improper operation of the Fat tester can endanger personnel and cause property damage.
- If the Fat Tester is used in a manner not specified in this manual, the protection provided may be impaired.
- Verify that the input voltage printed on the voltage identification label information and the plug type matches the local AC power supply.
- The fat tester has a 3-pin power cable that includes a ground connection. Intentionally disabling the equipment grounding connection is prohibited.
- Do not position the Fat tester so that it is difficult to disconnect the Power Plug from the local AC power supply.
- Make sure that the power cord does not pose any obstacle or tripping hazard.
- Do not operate the Fat tester in hazardous, wet or unstable environments.
- Disconnect the Fat tester from the power supply when cleaning the Fat tester.
- Ensure sufficient free space around the Fat tester as a safety zone. Allow at least 1 meter of free space above the Fat tester.
- The Fat tester must be operated only by trained personnel who are familiar with the properties of the samples being tested and with the equipment operation.
- Use appropriate personal safety equipment such as safety glasses, gloves, protective clothing and respirators.
- Do not make any modifications to the Fat tester.
- Service should be performed only by authorized personnel.

The Fat tester works with heat!

- Never place flammable materials on, below or next to the Fat tester.
- Use caution when removing a test sample. The sample, the sample chamber, the heating element and the surrounding areas may be very hot and can cause burns.

Some samples require special care!

- Should there be any uncertainty regarding the safety of a substance, perform a careful risk analysis. In such cases, never leave the Fat tester unattended.
- **Fire or explosion**: Substances which contain solvents or release flammable or explosive vapors when heated. With such samples, work at drying temperatures low enough to prevent the formation of flames or an explosion.
- **Poisoning or burning**: Substances which contain toxic or caustic components should only be dried in a fume hood.
- **Corrosive**: Substances which release corrosive vapors when heated should be tested in small amounts.
- The user assumes responsibility for any damage caused by the use of these types of samples.

Application Disclaimer

Moisture determination applications must be optimized and validated by the user according to local regulations. Application specific data provided by DSC is for reference purposes only. DSC waives all liability for applications based on this data.

2.   INSTALLATION

Package Contents

Fat Tester	In-Use Cover
Draft Shield	Sample Test Kit (10 Test)
Pan Support	Instruction Manual
Power Cable	

Selecting the Location

- Operate the Fat tester on a firm, level surface.
- Select a location that is safe and with adequate ventilation. Fire, corrosive or toxic fumes and other hazards associated with the test samples will require specially prepared locations.
- Ensure that the location has easy access to the local AC power supply.
- Avoid locations with rapid temperature changes, excessive humidity, air currents, vibrations, electromagnetic fields, heat or direct sunlight.
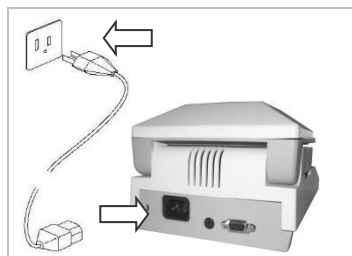
Installing Components

(1) Install and position Draft Shield	(2) Install Pan Support, turn until it engages into position	(Optional Sample Pan Handler Not Included) - Slide an empty sample pan under the pan handler, then place over the pan support.

Connecting Power

Verify that the input voltage printed on the voltage identification label information and the plug type matches the locations AC power supply.

Connect the supplied power cable to the power input receptacle at the rear of the Fat tester and into a properly grounded power outlet.

Power: On (short press) / Off / Standby Mode (long press)
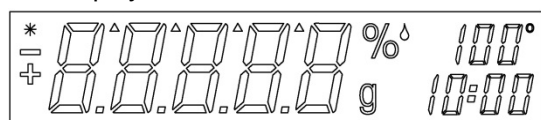When powered on from standby mode, the Fat tester is ready for immediate use.

See also Section 1, Safety Precautions.

After connecting the Fat tester to the AC supply (standby mode), allow the Fat tester to warm up for at least 15 minutes for best results.
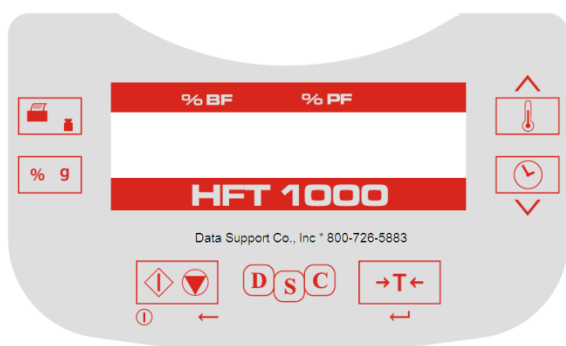
3. OPERATION

Display

✻	Stable indicator
%	Percent Fat
%	Percent moisture
g	grams
100°	Temperature setting or current chamber temperature (Celsius)
10:00	Time setting (minutes : seconds)

Controls

Button:	Name:	Quick Functions:	Button:	Name:	Quick Functions:
	Start / Stop	On (short press) / Off (long press) Start/Stop (short press) Back (short press)		Set ▲	Increase **value** (short or long press)
	Tare	Tare (short press) Enter / Accept value (short press)		Set ▼	Decrease **value** (short or long press)
	Temp	Temperature Setting (short press)		Print / Cal	Print (short press) Calibrate (long press)
	Time	Time Setting (short press)		%g	Result Unit (short press)

There are also several modes of operation which affect how each button operates. Please refer to the following section.

Operating Modes

Standby Mode: When the Fat tester is connected to AC power and the display is off, the unit is in Standby mode.

Start   (Short press) Turns on the display and enters Weigh mode.

Print   (Long press) displays the RS232 settings (see Section 6, RS232 Data Connection.). Thereafter,
         (Short press) Re-enters Standby mode (off).

Weigh Mode: The display shows the weight of items placed on the pan support.

Tare   (Short press) sets the displayed weight value to zero

Start   (Long press) Enters Standby mode (Off)

The following operations can be initiated:

Temp   (Short press) Enters Edit mode for the temperature setting, the value will blink

Time   (Short press) Enters Edit mode for the time setting, the value will blink

Start   (Short press) Activates Run mode, initiates test with a sample greater than 0.5 g

Cal   (Long press) Initiates weight or temperature Calibration (see Section 5, Maintenance)

Run Mode (Performing a Test)

A Fat test is initiated. The results in progress are displayed.

Start   (Short press) Activates Run mode, initiates test with a sample greater than 0.5 g.

%g   Changes the unit of the displayed result: % Beef Fat or % Pork Fat

Stop   (Short press) manually stops the test in progress.

Print   Sends the current displayed value to the RS232.

Result Mode

At the end of the test (Run Mode), the display blinks the test result.

%g   Changes the unit of the displayed result: % Beef Fat or % Pork Fat

Tare   Exits to weigh mode.

Print   Sends the current displayed value to the RS232.

How to Prepare a Test (See Page 5 for a step by step detail on running a test.)

- Press Tare to zero out the pan weight.
- Remove the test pan and place the test sample onto the test pan. The sample must be greater than 0.5g.
- Spread the sample evenly across the test pan.
- Place the test pan with the sample on the Pan Support. The weight value of the sample will be displayed.

Section 4. Running A Test gives further details on sample sizes, and proper preparation of samples.

How to Perform a Test (See Section 4 on further details on performing a test)

(1) Close the Heater Cover.
(2) Press Start to begin the test (press Start again to stop the test in progress).
(3) When the test is over the display will blink showing the final result.
(4) To change the displayed units, press %g.
(5) To print the current displayed value, press Print.
(6) Press Tare to exit to weigh mode.

Performing a Trial Test

Prior to actual testing, a test run can be performed with these suggested settings:

(1) Temperature = 160
(2) Time = AUTO
(3) Sample = 3g of water. Place a glass fiber pad (included with the Fat tester) on the test pan, place on Pan Support. Press Tare to zero the pan weight. Add 3g of water to the fiber pad.
(4) Press Start to initiate the test. A perfect result on the trial test would be: 0g, 100% moisture or 0%solids.

Results may vary slightly due to weighing errors involved with a small sample, or other experimental errors.

Sample Weight

The ideal weight is 3-4 grams. However, for samples that are well mixed (homogenous), two (2) grams of sample is enough. A smaller sample size takes shorter test time. When measuring out your sample, always start with a small sample and add to reach the ideal weight. (Do not place a large amount of sample and take out the excess to reach the ideal weight. Doing this will result to higher fat reading since the sample pad will start absorbing the fat as soon as the meat is placed on the pads).

RUNNING A TEST

What You will Need:

1.) Rubber Spatula or plastic spoon
2.) 2 Disposable Glass Fiber Pads (contact DSC @ 800-726-5883 to order supplies)
3.) 1 Disposable Aluminum Dish (contact DSC @ 800-726-5883 to order supplies)
4.) Small grinder / Food processor such as a small Mr. Coffee grinder **(Optional)** or a resealable sample bag **(Optional)**

Step 1. (Recommended) Preparing the Meat.

A well mixed (homogenous) sample will provide more accurate and consistent results. It also allows you to use a smaller sample size (2 gm) which will take shorter time to test. Below are **optional** steps to choose from to ensure that your sample is homogenous:

1. *Using a Grinder/Food Processor*

Begin by taking small pinches of meat from every area of you entire batch (i.e. take from the sides, the middle, the center etc.) Collect about a pound. Depending on the capacity of your food processor, you may need to increase or decrease the amount of meat to be collected. Then place the meat you have collected in your grinder / food processor. Mix for 60 seconds. Using a spatula or spoon, scrape any fat or meat that may have stuck to the walls of the grinder / food processor and integrate it back into the rest of the mix. Mix again for 30 seconds. Scrape any fat or meat that may have stuck to the walls of your grinder/processor and integrate that back into the mix.

2. *Using a DSC Sample Bag*

Using a food processer is the best way to ensure that your sample is homogenous. However, if one is not available, kneading the sample using the DSC sample bag is another option. Place at least ½ pound of sample in the bag. Knead the sample for at least a minute or until the sample is well mixed.
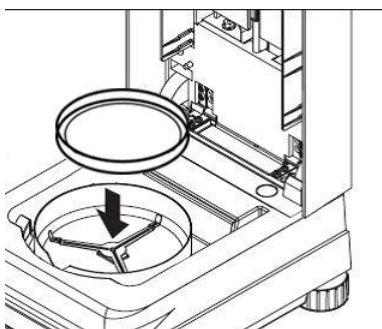
Step 2. Running A Fat Test with the HFT-1000F

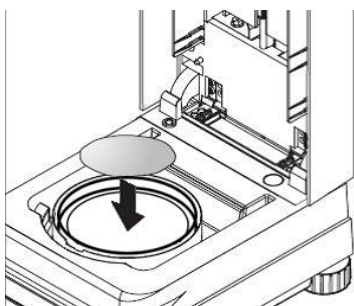Turn on the HFT-1000F by Pressing the "On/Off" Button.
The Display Reads:

Open up the hood and place (1) Aluminum Dish on the pan support.

Place (2) Glass Fiber Pads in the Aluminum Dish

Press the Tare Button

The Display Now Reads:

Remove the (2) Glass Fiber Pads from the Aluminum Dish. Take your spatula or plastic spoon to scoop up a *Half Dollar size amount of meat.

The ideal weight is 3-4 grams. However, for samples that are well mixed (homogenous), two (2) grams of sample is enough. A smaller sample size takes shorter test time. When measuring out your sample, always start with a small sample and add to reach the ideal weight. (Do not place a large amount of sample and take out the excess to reach the ideal weight. Doing this will result to higher fat reading since the sample pad will start absorbing the fat as soon as the meat is placed on the pads).

Using the underside of the spoon or spatula, spread the meat over the smooth side of (1) Glass Fiber Pad. Spread thinly over the pad leaving about ¼ of an inch uncovered. (See Diagram Below)

Using the other Glass Fiber sheet, Place on top of the Pad with the spread meat and sandwich them together. Press Firmly to avoid separation during the test. Flip the pads over in such a way that the pad were the sample was spread will be on top.

Place the sandwiched pads back onto the Aluminum Dish. You will see the numbers change to display the weight of the meat. Wait for the asterisk (*) symbol to appear. This indicates that the machine has stabilized and has properly recorded the weight of your sample.
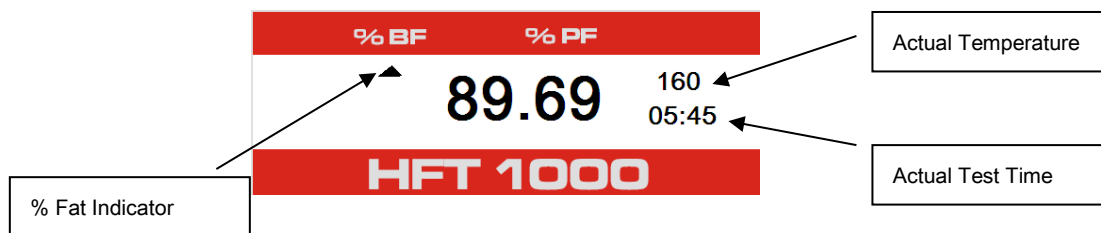

Now Close the cover and Press the "Start / Stop button

The Fat Tester will now begin the test. Once the test is done, the %Fat Reading will be blinking with a beeping.

The % Fat Indicator ▲ symbol appears beneath the meat Type it is displaying.
%BF= Beef Fat & %PF = Pork Fat

% Fat Indicator

Actual Temperature

Actual Test Time

Press the % g button [**% g**] to change reading to %BF (Beef Fat) or %PF (Pork Fat).

Record the reading.

Follow the Steps above to run another Test.
Remember to Use a new Aluminum Dish and (2) Glass Fiber Pads for every test.

Weight Calibration

Weight calibration is recommended annually, but can be performed at the End Users Discretion. The Fat Testers use relative weight values to determine the results, so a minor offset from the absolute weight has little effect on accuracy. Our Fat Testers have rugged, high quality temperature stabilized weighing modules that retain their calibration over long periods of time.

(1)   Remove any load on the Pan Support including the sample pan.
(2)   Press and hold **Cal** while in the Weigh mode. "CAL" will appear followed by "50.00g".
(3)   Place a 50g calibration mass on the Pan Support. The display will show "-----".
(4)   Remove the mass when "--0--" is shown on the display. The display will show "-----".
(5)   The Analyzer will return to Weigh mode when calibration is complete.
Note: Pressing START will cancel the calibration without saving the changes.

Temperature Calibration: Temperature calibration is rarely required under normal use. If the heating elements become dirty, the usual setting may no longer produce the same results. A temperature calibration can correct for these changes.

⚠ Use only the DSC Temperature Calibration Kit (accessory) to perform temperature calibration. Damage to the Fat tester can occur if using other methods.

(1)   Remove the Pan Support. "Err8.4" must be shown on the display for the temperature calibration to start.
(2)   Place the DSC Temperature Calibration Kit into the temperature chamber (see Kit Instructions). Close Cover.
(3)   Press and hold Cal until "Cal" is displayed. When Cal is released "TC100" will appear and the heater turns on.
(4)   After 15 minutes, the unit will beep and blink "100" on the display.
(5)   Read the thermometer on the Temperature Calibration Kit and press Set▲ ▼ to change and match the displayed value to the thermometer reading.
(6)   Press Tare to enter the value. The display will show "TC160" as the heater turns on again.
(7)   After 15 minutes, the unit will beep and blink "160" on the display.
(8)   Read the thermometer on the Temperature Calibration Kit and press Set▲ ▼ to change and match the displayed value to the thermometer reading.
(9)   Press Tare to enter the value. The Fat tester returns to weigh mode.
(10)   Temperature calibration is now complete.

Note: If Tare is not pressed within 10 minutes the calibration will be aborted.

Cleaning
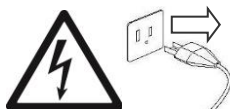
- Disconnect the Fat tester from the power supply before cleaning the Fat tester.
- Make sure that no liquid enters the interior of the Fat tester.
- Make sure the Fat tester is cooled down before cleaning.

IR Coil
Temperature sensor
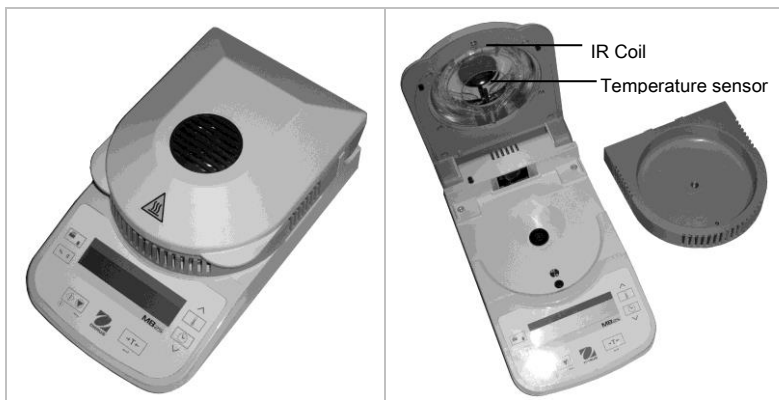
- Clean the Fat tester at regular intervals.
- Housing surfaces and the temperature sensor may be cleaned with a lint-free cloth slightly dampened with water or a mild cleaning agent.
- Glass surfaces may be cleaned with a commercial glass cleaner.
- Do not use solvents, harsh chemicals, ammonia or abrasive cleaning agents.

Troubleshooting

Symptom / Display	Possible Cause	Remedy
Cannot turn on	No power to Fat tester	Verify connections and voltage
Weight value blinking	Sample weight less than 0.5g	Increase samle size
"Tare" shown	Pan weight needs set to zero	Press Tare
"Close Cover" shown	Cover needs to be closed before starting test	Close Cover
Poor accuracy	Improper calibration	Perform calibration
	Unstable environment	Move the Fat tester to suitable location
Cannot calibrate	Unstable environment	Move the Fat tester to suitable location
	Incorrect calibration masses	Use correct calibration masses
Err 7.0	Time out	
Err 8.1	Pan Support has load during power on	Remove weight from pan support
Err 8.2	Pan Support was removed prior to power on	Install Pan Support
Err 8.3	Weight on Pan Support exceeds capacity	Remove weight from the Pan Support
Err 8.4	Pan Support was removed during weighing	Re-install Pan Support
Err 9.5	Factory calibration data corrupted	Contact DSC at 800-726-5883
Err 53	EEPROM Checksum error	Contact DSC at 800-726-5883

Service Information

If the troubleshooting section does not resolve or describe your problem, contact your authorized DSC service agent. Please visit our web site: www.dsctest.com. Call 800-726-5883

Accessories

Description	Part No.	Description	Part No.
Sample Test Accessories (100 Test)	PD100T	Printer Ribbon Cassette	RC200P
Sample Pan Handler	80252476	Protective Shipping Casing	200S
50g Calibration Weight	51054-16	Carrying Case	TBD
Thermal Printer	DSC103G	Security Locking Cable	76288-01
Paper for Printer	PP250X80	Security Lock (Kensington® type)	470004-010
		Temperature Calibration Kit	11113857

4. TECHNICAL DATA

Admissible Ambient Conditions

Location:	Indoor use only
Temperature:	20°C to 40°C
Relative humidity:	15 % to 80 % at 30°C non-condensing
Warm up time:	At least 15 minutes after connecting the Fat tester to the AC supply; when switched from standby mode the Fat tester is ready for immediate use.
Height above sea level:	Up to 2000 m
Power Input:	100VAC - 120VAC, 3A, 50/60Hz or 200VAC -240VAC, 3A, 50/60Hz
Voltage fluctuations:	-15% +10%
Power load:	MB25: 250W; MB23:300W (Maximum during drying process)
Power line fuse:	1 piece, 5 x 20mm, 8A 250V

Protected against dust and water, Pollution degree: 2, Installation category: Class II

Specifications

MODEL	HFT 1000
Capacity	110g
Readability (% requires 2-3g sample)	1%
Temperature Settings	50°C to 160°C (5° increments)
Heat Source	Infrared
Calibration - Weight	50g
Calibration - Temperature	DSC Temperature Calibration Kit
Pan Size	90mm diameter
Unit Dimensions (DxWxH)	11.0x6.5x5.0 in / 28.0x16.5x12.7 cm
Unit Weight	4.6 lb / 2.1 kg
Shipping Dimensions (LxWxH)	20.2x15.5x13.5 in / 51x40x35 cm
Shipping Weight	10 lb / 4.5 kg

Communication

RS232 Pin Connections
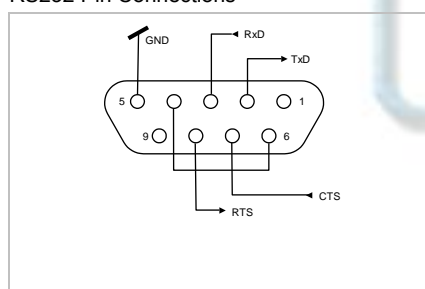
Female DB9 connector

Pin 2: Fat tester transmit line (TxD)

Pin 3: Fat tester receive line (RxD)

Pin 4 and 6: Internally connected

Pin 5: Ground signal (GND)

Pin 7: Clear to send (hardware handshake) (CTS)

Pin 8: Request to send (hardware handshake) (RTS)

RS232 Data Settings (default)

Baud Rate: 2400   Data Bits: 7   Parity: N   Stop Bits: 2   Flow Control: Xon/Xoff

RS232 Commands

The RS232 Interface allows a computer to control the Fat tester, as well as to receive data such as displayed weight.

Command	Function
ON	Turns Fat tester ON
OFF	Turns Fat tester OFF
T	Same as pressing Tare
U	Same as pressing %g
START	begins a test
STOP	ends a test
P	Same as pressing Print

xP	Interval Print x = Print Interval (1-3600 sec)
PSN	Print Serial Number
PV	Print software version
?	Print Header
H	Header on or off
RS	Print current RS232 settings
RS:2400,7,N,2,X	Change RS232 setting (The current RS232 setting can be displayed on the LCD by pressing Print for 2 seconds while in standby mode.) Baud:1200,2400,4800,9600,19200 Data Bits: 7 or 8 Parity: N = none, O = odd, E = even Stop Bits: 1 or 2 Handshake: X = xon/xoff (software), R = RTS-CTS (hardware), N = none
ⓘ	The Fat tester will return "ES" for invalid commands. All communication uses standard ASCII format. Sent commands must terminate with a Line Feed or Carriage Return Line Feed (CRLF).

RS232 Output

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FAT DETERMINATION                       Header on
DSC HFTx SN ########                    Header on
Switchoff Mode      TIMED 10:00         Header on
Drying Temp         100C                Header on
Result Units        %Moisture           Header on


00:10      0.0%MC                       If Print pressed or print interval set.
00:20      0.0%MC                       If Print pressed or print interval set.


Elapsed Time             00:02:21       Printed at successful end of test.
Initial Weight           8.560 g        Printed at successful end of test.
Final Weigh              8.555 g        Printed at successful end of test.
Final Result       0.0%MC               Printed at successful end of test.
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Compliance

Compliance to the following standards is indicated by the corresponding mark on the product.

Marking	Standard
CE	This product conforms to the EMC directive 2004/108/EC and the Low Voltage Directive 2006/95/EC. The complete Declaration of Conformity is available from DSC Corporation
(C-Tick)	AS/NZS4251.1 Emission, AS/NZS4252.1 Immunity
CSA C US	CAN/CSA-C22.2 No. 61010-1-04; UL Std. No. 61010A-1

Disposal

In conformance with the European Directive 2002/96/EC on Waste Electrical and Electronic Equipment (WEEE) this device may not be disposed of in domestic waste. This also applies to countries outside the EU, per their specific requirements.

Please dispose of this product in accordance with local regulations at the collecting point specified for electrical and electronic equipment. If you have any questions, please contact the responsible authority or the distributor from which you purchased this device.

Should this device be passed on to other parties (for private or professional use), the content of this regulation must also be related.

Thank you for your contribution to environmental protection.

FCC Note

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

Industry Canada Note

This Class A digital apparatus complies with Canadian ICES-003.

Cet appareil numérique de la classe A est conforme à la norme NMB-003 du Canada.

LIMITED WARRANTY

DSC products are warranted against defects in materials and workmanship from the date of delivery through the duration of the warranty period. During the warranty period DSC will repair, or, at its option, replace any component(s) that proves to be defective at no charge, provided that the product is returned, freight prepaid, to DSC.

This warranty does not apply if the product has been damaged by accident or misuse, exposed to radioactive or corrosive materials, has foreign material penetrating to the inside of the product, or as a result of service or modification by other than DSC. In lieu of a properly returned warranty registration card, the warranty period shall begin on the date of shipment to the authorized dealer. No other express or implied warranty is given by DSC. DSC shall not be liable for any consequential damages.

As warranty legislation differs from state to state and country to country, please contact DSC Toll Free at 800-726-5883 or Tel: 818-988-7499.

Data Support Co., Inc.

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